Journal of Ecohumanism
2024
Volume: 3, No: 7, pp. 1309 – 1324
ISSN: 2752-6798 (Print) | ISSN 2752-6801 (Online)
https://ecohumanism.co.uk/joe/ecohumanism
DOI: https://doi.org/10.62754/joe.v3i7.4291

Development Model of Sustainable Agrotourism-Based Village Tourism for Improving Community Welfare in Tapanuli Utara Regency, Indonesia

Iwan Riady[1], Sirojuzilam[2], Agus Purwoko[3], Satia Negara Lubis[4], Charloq[5]

Abstract

This study examines the impact of village tourism development on sustainable agrotourism and community welfare in Tapanuli Utara Regency, Indonesia. Utilizing a mixed-methods approach that combines household surveys and structural equation modeling (SEM), data were collected from 203 respondents across 22 villages to evaluate the relationships among infrastructure development, local economic benefits, community participation, rural tourism products, sustainable agrotourism, and community welfare. The results indicate that village tourism development significantly and directly enhances both sustainable agrotourism and community welfare, with infrastructure and local economic benefits being the most influential factors. In contrast, community participation and rural tourism products did not show significant individual effects, suggesting that without proper support, training, and resource allocation, these elements may not effectively contribute to sustainable agrotourism. Moreover, sustainable agrotourism was found to significantly mediate the relationship between tourism development and community welfare, highlighting its role as a catalyst for long-term socio-economic improvement. The study underscores the necessity for integrated development strategies that prioritize infrastructure enhancement and local economic engagement while fostering sustainable agricultural practices within tourism. Limitations of the study include its regional focus, which may affect the generalizability of the findings, and the need for further research to explore effective mechanisms for boosting community participation and developing rural tourism products. These insights offer valuable guidance for policymakers and stakeholders aiming to promote sustainable rural tourism and enhance community welfare in similar contexts.

Keywords: *Village Tourism Development, Sustainable Agrotourism, Community Welfare, Structural Equation Modeling, Tapanuli Utara.*

Introduction

The significant potential of the tourism sector in enhancing rural community welfare has long been acknowledged in academic literature (Li, 2024). Specifically, rural tourism, particularly agritourism, presents opportunities to leverage natural and cultural resources to create sustainable economic benefits for local populations (Sembiring et al., 2021; Sudarmini et al., 2020; Abdillah et al., 2020). North Tapanuli Regency, with its rich natural and cultural assets, including fertile agricultural land, pristine forests, and unique local traditions, is an ideal candidate for sustainable agritourism-based village development. The role of sustainable tourism in supporting community welfare has been echoed globally, aligning with the Sustainable Development Goals (SDGs) target to eradicate extreme poverty by 2030 (Satia Negara Lubis & Arga Abdi Rafiud Darajat Lubis, 2024).

However, despite this potential, North Tapanuli continues to face significant challenges in improving community welfare. High poverty and unemployment rates, especially in rural areas, remain pressing issues (BPS, 2021; Cohen & Cohen, 2014; UNWTO, 2012). Similar challenges have been noted in other regional studies, such as Asahan Regency, where socio-economic impacts from housing development revealed issues of job displacement and reduced social interaction (Suharizki et al., 2024). While past research has shown that tourism development can substantially improve local economies, challenges such as local community participation and the sustainability of tourism programs persist (Cohen & Cohen, 2014; Diener et al., 1999; Sen, 1999). These barriers underscore the need for new models that address both economic development and the challenges of local involvement.

[1] Rural Area and Development Program, Universitas Sumatera Utara, Medan, Indonesia.
[2] Rural Area and Development Program, Universitas Sumatera Utara, Medan, Indonesia, Email: sirojuzilam@usu.ac.id, (Corresponding Author)
[3] Rural Area and Development Program, Universitas Sumatera Utara, Medan, Indonesia.
[4] Rural Area and Development Program, Universitas Sumatera Utara, Medan, Indonesia.
[5] Rural Area and Development Program, Universitas Sumatera Utara, Medan, Indonesia

Journal of Ecohumanism
2024
Volume: 3, No: 7, pp. 1309 – 1324
ISSN: 2752-6798 (Print) | ISSN 2752-6801 (Online)
https://ecohumanism.co.uk/joe/ecohumanism
DOI: https://doi.org/10.62754/joe.v3i7.4291

Previous studies have extensively explored the role of agritourism in regional development. For instance, Suharizki et al. (2024) highlighted the socio-economic transformations due to land use changes in rural areas, while Tiurma et al. (2024) emphasized the importance of local institutions and infrastructure in improving agricultural productivity. However, many of these studies have focused on singular aspects such as economic impact or institutional support. This leaves a gap in research that comprehensively integrates economic, social, and environmental factors in agritourism-based development. This research aims to fill that gap by developing a village development model that integrates agritourism with sustainable practices and community welfare.

Globally, sustainable development efforts have placed a growing emphasis on rural areas as key locations for alleviating poverty (Zaneva, 2022). The United Nations' Sustainable Development Goals (SDGs) emphasize that the eradication of extreme poverty is a key target by 2030 (Satia Negara Lubis & Arga Abdi Rafiud Darajat Lubis, 2024). In alignment with this, studies like those of Abdul et al. (2024) have demonstrated that regional development must consider comprehensive approaches, combining spatial planning, infrastructure, and environmental management to achieve long-term success. Unlike previous studies, this research addresses the specific context of North Tapanuli, where rural tourism and agritourism hold significant potential to both preserve environmental resources and improve socio-economic conditions.

In addition to its holistic approach, this study focuses on the concept of community welfare as a central measure of success. Previous research has largely focused on economic outcomes alone (Sen, 1999; Sachs, 2015; Stiglitz, 2011). However, recent studies, such as those by Rizki et al. (2024), have underscored the importance of social factors, including healthcare and education, in improving human development indices. This research builds on such findings, emphasizing the need for a multidimensional welfare approach, including access to education, health services, and environmental sustainability, in addition to economic benefits.

In the context of North Tapanuli Regency, the integration of agritourism in village development is expected to provide solutions for improving community welfare through environmental preservation and enhancing local income (Sembiring et al., 2021; Cohen et al., 2014; Saraswati et al., 2020). The importance of environmental preservation and sustainable tourism management has also been highlighted by Anisah (2024), who emphasized community empowerment within ecotourism areas. Sustainable agritourism not only creates new economic opportunities but also contributes to environmental preservation through eco-friendly agricultural practices (Cohen et al., 2014; UNWTO, 2012; Sachs, 2015). This study seeks to develop a model that can be widely applied in similar regions, focusing on long-term sustainability and active community participation.

In contrast to previous research, this study uniquely integrates three key dimensions: economic development, social welfare, and environmental sustainability. Studies such as Masrizal et al. (2024) have noted the importance of stakeholder collaboration in achieving development goals, particularly in rural areas. However, few studies have combined these elements into a single model of development. By doing so, this research provides a new perspective on how agritourism can drive holistic rural development and improve community welfare.

Thus, this research offers a novel contribution by developing a sustainable agritourism-based village development model that is directly linked to improving community welfare. Unlike previous studies that tend to focus on isolated aspects of tourism development (Cohen & Cohen, 2014; UNWTO, 2012; Diener et al., 1999), this study integrates a holistic approach that simultaneously addresses economic, social, and environmental dimensions. This approach provides practical guidance for policymakers at both local and national levels in developing sustainable and inclusive village tourism, offering insights for replicating such models in other regions facing similar challenges.

Journal of Ecohumanism
2024
Volume: 3, No: 7, pp. 1309 – 1324
ISSN: 2752-6798 (Print) | ISSN 2752-6801 (Online)
https://ecohumanism.co.uk/joe/ecohumanism
DOI: https://doi.org/10.62754/joe.v3i7.4291

Research Method

Research Design

This research adopts a descriptive and explanatory design. Descriptive research is used to provide a detailed account of the phenomenon of sustainable agritourism-based village development in North Tapanuli Regency, while explanatory research examines the relationships between key variables and tests the proposed hypotheses. By integrating both approaches, this study aims to describe the current state of agritourism and explain the causal relationships between sustainable agritourism and community welfare. This mixed-methods approach ensures a comprehensive understanding of the context and the dynamics at play, adhering to best practices in rural development research (Creswell, 2014; Yin, 2014).

Research Location

The study was conducted in North Tapanuli Regency, located in North Sumatra Province, Indonesia. This area was selected due to its significant potential for sustainable agritourism, as indicated by the presence of several villages with strong horticultural products, including salak (snake fruit), kemenyan (benzoin), and other commodities. North Tapanuli is also a designated tourism village region, as outlined by Peraturan Bupati No. 27 Tahun 2018 regarding the establishment of tourist villages. The local government's efforts to integrate agritourism with village development make this region a relevant case study for exploring sustainable models of community welfare improvement.

Population and Sampling

The population for this research includes all households in North Tapanuli Regency, totaling 69,657 households according to BPS data from 2020. A sample of 203 households was determined using the Slovin formula with a margin of error of 7%, ensuring an adequate representation of the population. A probability sampling technique was applied to ensure that each household had an equal chance of being selected, enhancing the generalizability of the findings (Sangadji & Sopiah, 2016). The sample was distributed across 22 villages in eight subdistricts, each of which represents different agritourism potentials, as shown in Table 1.

Table 1. Distribution of Quantitative Samples

Subdistrict	Village	Agritourism Product	Sample	Subdistrict
1	Siatas Barita	Lobu Hole	Agrowisata	7
2	Siatas Barita	Pancur Napitu	Kebun Salak	8
3	Adiankoting	Dolok Nauli	Kemenyan	8
4	Sipoholon	Situmeng Habinsaran	Agrowisata	8
5	Pagara	Lumban Silintong	Agro Tembakau	5
6	Parmonangan	Huta Julu Parbalik	Kemenyan	4
7	Muara	Silando	Agro Hortikultura	10
8	Muara	Bariba Ni Aek	Sawah Terasering	7
9	Muara	Silalitoruan	Sawah Terasering	8
10	Muara	Sampuran	Kebun Mangga	10
11	Muara	Dolok Martumbur	Agro Holtikultura	10
12	Muara	Simatupang	Kebun Mangga	12
13	Muara	Papande	Kebun Mangga	6
14	Muara	Batubinumbun	Kebun Mangga	10
15	Sipahutar	Onan Runggu I	Agro Nanas	15
16	Sipahutar	Onan Runggu II	Agro Nanas	16
17	Sipahutar	Onan Runggu III	Agro Nanas	14
18	Pangaribuan	Raut Bosi	Agro Kopi	14
19	Garoga	Aek Tangga	Kebun Salak	7

Journal of Ecohumanism
2024
Volume: 3, No: 7, pp. 1309 – 1324
ISSN: 2752-6798 (Print) | ISSN 2752-6801 (Online)
https://ecohumanism.co.uk/joe/ecohumanism
DOI: https://doi.org/10.62754/joe.v3i7.4291

Subdistrict	Village	Agritourism Product	Sample	Subdistrict
			Hutan Kemenyan	
20	Pahae Julu	Hutabarat	Persawahan Aek Nambilung	8
21	Pahae Jae	Nahornop Marsada	Agro Nanas	8
22	Pahae Jae	Parsaoran Nainggolan	Agro Kampung Coklat	8
Total				203

For the qualitative data, purposive sampling was employed to select informants with relevant knowledge of agritourism in North Tapanuli. This included key stakeholders from the pentahelix model: government officials, academics, local tourism managers, industry representatives, and media personnel. These informants were selected based on their involvement in agritourism development and their ability to provide valuable insights into the phenomenon under study.

Types and Sources of Data

This study utilized both quantitative and qualitative data. Quantitative data were collected from household surveys, while qualitative data were gathered from interviews, observations, and document reviews. According to Wibisono (2003), qualitative data provides rich, non-numerical insights into social phenomena, while quantitative data allows for statistical analysis to examine relationships between variables. Primary data were collected through structured questionnaires, and secondary data were gathered from local government offices, relevant literature, and official reports (Sugiyono, 2017).

Data Collection Techniques

The data collection process included four primary methods:

- Literature Review: Relevant literature, documents, and reports were reviewed to provide a foundation for the research and to support the analysis of agritourism and community welfare (Creswell, 2014).
- Observation: Direct observations were conducted in the field to assess the infrastructure, tourist activities, and overall conditions in the agritourism villages.
- Interviews: In-depth interviews were conducted with selected informants using a semi-structured format, ensuring that the discussions remained focused while allowing flexibility to explore new insights.
- Questionnaire: A structured questionnaire was administered to household representatives across the sample villages. The questionnaire employed a Likert scale to measure respondents' perceptions of various aspects of village development, sustainable agritourism, and community welfare.

The Likert scale ranged from 1 to 5, where:

- 5 = Strongly Agree
- 4 = Agree
- 3 = Neutral
- 2 = Disagree
- 1 = Strongly Disagree

Journal of Ecohumanism
2024
Volume: 3, No: 7, pp. 1309 – 1324
ISSN: 2752-6798 (Print) | ISSN 2752-6801 (Online)
https://ecohumanism.co.uk/joe/ecohumanism
DOI: https://doi.org/10.62754/joe.v3i7.4291

2.6 Data Analysis Techniques

Both qualitative and quantitative analysis techniques were employed in this study to provide a comprehensive evaluation of the data.

- Qualitative Analysis: A thematic analysis was conducted to interpret the qualitative data collected from interviews and observations. This approach allowed the identification of key themes related to sustainable agritourism and community participation (Braun & Clarke, 2006). The analysis focused on understanding how various stakeholders perceive agritourism's impact on community welfare and environmental sustainability.

- Quantitative Analysis: The quantitative data were analyzed using Partial Least Squares Structural Equation Modeling (PLS-SEM). This method was chosen because of its ability to handle complex relationships between variables, particularly in exploratory research contexts. The model was evaluated through outer (measurement) models to assess reliability and validity, and inner (structural) models to examine the hypothesized relationships between sustainable agritourism, village development, and community welfare (Willy & Hartono, 2015).

    - Measurement Model (Outer Model): Convergent and discriminant validity were assessed through loading factors and Average Variance Extracted (AVE), ensuring that the measurement instruments were valid and reliable (Hair et al., 2010).

    - Structural Model (Inner Model): The structural relationships between variables were tested using R^2, Q^2, and Goodness of Fit (GoF) indices. Hypothesis testing was conducted using t-tests and p-values to evaluate the significance of path coefficients. The R^2 value provided insights into the variance explained by the independent variables on the dependent variables, with a value of 0.1 or higher considered acceptable (Willy & Hartono, 2015).

Conceptual Framework

The conceptual framework guiding this research outlines the relationships between tourism development, sustainable agritourism, and community welfare. As depicted in Figure 1, sustainable agritourism acts as a mediating variable, influencing the direct and indirect effects of village development on community welfare. This comprehensive model ensures that the various dimensions of economic, social, and environmental factors are considered, providing practical implications for policymakers and stakeholders.

Results and Discussions

Overview of the Research Area

General Overview of North Tapanuli Regency

North Tapanuli is a district in North Sumatra Province, located in the highland development area, with an elevation ranging from **300 to 1500 meters above sea level**. The topography of North Tapanuli is diverse: **3.16% flat**, **26.86% sloping**, **25.63% inclined**, and **44.35% steep**. The district covers an area of **3,800.31 km²**, with **3,793.71 km²** of land and **6.60 km²** of water, primarily from Lake Toba.

The district consists of **15 sub-districts**, with **Garoga** being the largest (**567.58 km²**) and **Muara** the smallest (**79.75 km²**). **Agriculture** is a key sector, with high production levels, but there is potential for further growth if developed strategically, particularly in horticulture, which could contribute significantly to the region's economy and improve the welfare of local farmers.

Journal of Ecohumanism
2024
Volume: 3, No: 7, pp. 1309 – 1324
ISSN: 2752-6798 (Print) | ISSN 2752-6801 (Online)
https://ecohumanism.co.uk/joe/ecohumanism
DOI: https://doi.org/10.62754/joe.v3i7.4291

Geographical Location and Area of North Tapanuli

North Tapanuli is located in the highlands, ranging between 150 and 1,700 meters above sea level, at 1020'–2 041' North Latitude and 98005"–99016" East Longitude. It borders:

- North: Toba Samosir Regency
- East: Labuhan Batu Utara Regency
- South: South Tapanuli Regency
- West: Humbang Hasundutan and Central Tapanuli Regency

Figure 1. Research Location

Demographics of North Tapanuli

In 2017, North Tapanuli had a population of 297,806 people, with a sex ratio of 97.62 (indicating more females than males). The population density is relatively low at 78 people/km², with an average household size of 4 members. By 2020, the population had increased to 312,758, with 49.94% males and 50.06% females. The largest age group is between 0–19 years (40.36%), indicating a youthful population. Siborongborong has the highest population density, while Purbatua has the lowest.

Economic Conditions in North Tapanuli

- Trade: The region has 19 markets, with 4,409 traders. There are 4,708 units of stalls, including kiosks (760 units), shelters (1,802), and balairung (2,146).
- GRDP (Gross Regional Domestic Product): In 2017, the GRDP at current prices was 6.795 trillion rupiah, up from 6.3 trillion rupiah in 2016. The agricultural sector, including forestry and fisheries, contributed the most to the GRDP, 45.65%, followed by construction (14.53%) and wholesale/retail trade (12.93%).
- Poverty: The poverty rate in 2011 was 11.89% but fluctuated, reaching 11.35% in 2017.

Journal of Ecohumanism
2024
Volume: 3, No: 7, pp. 1309 – 1324
ISSN: 2752-6798 (Print) | ISSN 2752-6801 (Online)
https://ecohumanism.co.uk/joe/ecohumanism
DOI: https://doi.org/10.62754/joe.v3i7.4291

Overview of Research Respondents

A total of 350 questionnaires were distributed, with 203 returned (100% response rate). The characteristics of the respondents are detailed below.

Respondent Characteristics

Age

Respondents were categorized into four age groups:

Table 2. Respondents Characteristics by Age

No	Age Group	Frequency	Percentage
1	<30 years	9	4.43%
2	30–40	102	50.25%
3	41–50	64	31.53%
4	>50	28	13.79%
Total		**203**	**100%**

Gender

The table below shows the gender distribution of respondents:

Table 3. Respondents Characteristics by Gender

No	Gender	Frequency	Percentage
1	Female	61	30.05%
2	Male	142	69.95%
Total		**203**	**100%**

The majority of respondents were male (69.95%).

Data Analysis Results

Measurement Model (Outer Model = Model Validity and Reliability)

The measurement model assesses the validity and reliability of the research constructs through various tests.

Convergent Validity Test: This measures how well each indicator correlates with its underlying latent variable. Loading factors for all constructs exceeded 0.7, indicating strong validity.

Convergent Validity Test

The Convergent Validity Test was performed by analyzing the loading factor of each indicator against its latent variable. The results are summarized in Table 4:

Journal of Ecohumanism
2024
Volume: 3, No: 7, pp. 1309 – 1324
ISSN: 2752-6798 (Print) | ISSN 2752-6801 (Online)
https://ecohumanism.co.uk/joe/ecohumanism
DOI: https://doi.org/10.62754/joe.v3i7.4291

Table 4. Convergent Validity Results

Construct	Indicator	r-Value	Loading Factor	Conclusion
Infrastructure (X1)	Sarana1	0.898	> 0.7	Valid
	Sarana2	0.952	> 0.7	Valid
Local Benefit (X2)	Benefit1	0.942	> 0.7	Valid
	Benefit2	0.860	> 0.7	Valid
Community Participation (X3)	Part1	0.912	> 0.7	Valid
	Part2	0.927	> 0.7	Valid
Rural Tourism Products (X4)	Prod1	0.902	> 0.7	Valid

From the table, it is evident that all indicators have a loading factor exceeding the threshold of 0.7, confirming that all constructs are valid.

Discriminant Validity Test

The Discriminant Validity Test assesses whether the constructs are distinct from each other. The cross-loading method was used to verify discriminant validity, with the results summarized in Table 5:

Table 5. Discriminant Validity Results

Variable	X1	X2	X3	X4	Y	Z	Conclusion
X1	0.935						Adequate
X2	0.949	0.927					Adequate
X3	0.931	0.977	0.912				Adequate
X4	0.931	0.964	0.990	0.917			Adequate
Y	0.984	0.978	0.964	0.964	0.915		Adequate
Z	0.984	0.974	0.956	0.954	0.994	0.921	Adequate

All constructs have cross-loading values greater than **0.7**, confirming that the discriminant validity is adequate.

Discriminant Validity Based on Average Variance Extracted (AVE)

Table 6 displays the results of the Discriminant Validity Test based on the AVE value, where all constructs have an AVE exceeding **0.5**, indicating acceptable validity:

Journal of Ecohumanism
2024
Volume: 3, No: 7, pp. 1309 – 1324
ISSN: 2752-6798 (Print) | ISSN 2752-6801 (Online)
https://ecohumanism.co.uk/joe/ecohumanism
DOI: https://doi.org/10.62754/joe.v3i7.4291

Table 6. Discriminant Validity Based on AVE

Latent Variable	AVE (Calculated)	AVE (Standard)	Conclusion
Infrastructure (X1)	0.874	0.5	Adequate
Local Benefit (X2)	0.860	0.5	Adequate
Community Participation (X3)	0.831	0.5	Adequate
Rural Tourism Products (X4)	0.841	0.5	Adequate
Well-being (Y)	0.838	0.5	Adequate
Sustainable Agrotourism (Z)	0.849	0.5	Adequate

Reliability Test

The Reliability Test evaluates the internal consistency of the constructs. Cronbach's Alpha and Composite Reliability values are presented in Table 7:

Table 7. Reliability Test Results

Latent Variable	Cronbach's Alpha	Composite Reliability	Conclusion
Infrastructure (X1)	0.952	0.965	High
Local Benefit (X2)	0.945	0.961	High
Community Participation (X3)	0.959	0.967	High
Rural Tourism Products (X4)	0.937	0.955	High
Well-being (Y)	0.991	0.992	High
Sustainable Agrotourism (Z)	0.991	0.992	High

All constructs have a Cronbach's Alpha and Composite Reliability above 0.6, confirming that the measurement model is reliable.

Structural Model (Inner Model)

The structural model was analyzed to predict causal relationships among the latent variables, including hypothesis testing. This involved evaluating path coefficients and other statistical metrics.

Parameter Estimation and Model Evaluation

Path Coefficients

Table 8 presents the Path Coefficient results for the structural model:

Table 8. Structural Model Path Coefficients

Relationship	Coefficient	Conclusion
Tourism Development (X) → Well-being (Y)	0.320	Significant
Tourism Development (X) → Sustainable Agrotourism (Z)	0.982	Significant
Sustainable Agrotourism (Z) → Well-being (Y)	0.680	Significant

The table shows that all path coefficients are significant (T-statistic > 1.96), confirming the structural model's predictive power.

Journal of Ecohumanism
2024
Volume: 3, No: 7, pp. 1309 – 1324
ISSN: 2752-6798 (Print) | ISSN 2752-6801 (Online)
https://ecohumanism.co.uk/joe/ecohumanism
DOI: https://doi.org/10.62754/joe.v3i7.4291

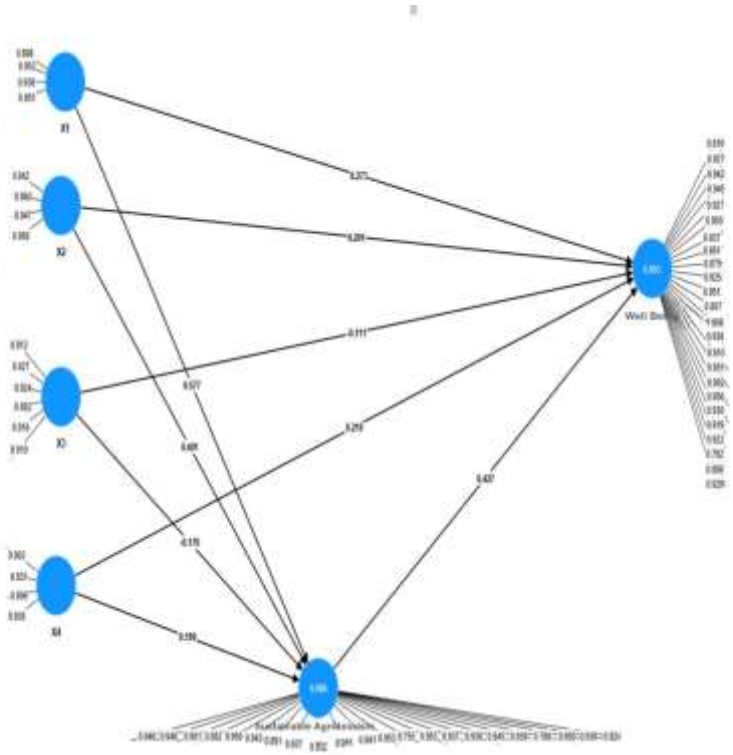

Figure 2. Diagram Path Analysis

Hypothesis Testing Results

Direct Effects of Exogenous Variables (X) on Endogenous Variables (Y)

The direct effects of Infrastructure (X1), Local Benefit (X2), Community Participation (X3), and Rural Tourism Products (X4) on Well-being (Y) are presented in Table 9:

Table 9. Direct Effects of X on Y

Variable	T-Statistic	P-Value	Conclusion
X1 → Y	9.172	0.000	Significant
X2 → Y	4.219	0.000	Significant
X3 → Y	1.107	0.268	Not Significant
X4 → Y	2.157	0.031	Significant

Community Participation (X3) was found to have no significant effect on Well-being (Y), with a T-Statistic < 1.96.

Direct and Indirect Effects of Exogenous Variables on Endogenous Variables (Y and Z)

Direct Effects of X1, X2, X3, and X4 on Sustainable Agrotourism (Z)

The direct effects of the independent variables Infrastructure (X1), Local Benefit (X2), Community Participation (X3), and Rural Tourism Products (X4) on Sustainable Agrotourism (Z) are outlined in Table 10.

Journal of Ecohumanism
2024
Volume: 3, No: 7, pp. 1309 – 1324
ISSN: 2752-6798 (Print) | ISSN 2752-6801 (Online)
https://ecohumanism.co.uk/joe/ecohumanism
DOI: https://doi.org/10.62754/joe.v3i7.4291

Table 10. Direct Effects of X on Z

Variable	T-Statistic	P-Value	Conclusion
X1 → Z	9.365	0.000	Significant
X2 → Z	4.159	0.000	Significant
X3 → Z	1.042	0.298	Not Significant
X4 → Z	1.521	0.128	Not Significant

The analysis reveals that Community Participation (X3) and Rural Tourism Products (X4) do not significantly influence Sustainable Agrotourism (Z), suggesting that these aspects require further development or integration to effectively contribute to agrotourism sustainability.

Simultaneous Effects of X on Z

The simultaneous effects of all exogenous variables on Sustainable Agrotourism (Z) are shown in Table 11.

Table 11. Simultaneous Effects of X on Z

Parameter	T-Statistic	P-Value	Conclusion
X → Z (Agrotourism)	310.089	0.000	Significant

All exogenous variables combined have a significant simultaneous effect on Sustainable Agrotourism (Z), indicating that the overall tourism development positively impacts sustainable agrotourism when viewed as a whole.

Indirect Effects of Exogenous Variables on Well-being (Y) Through Sustainable Agrotourism (Z)

Table 12 summarizes the indirect effects of tourism development (X) on Well-being (Y) through Sustainable Agrotourism (Z).

Table 12. Indirect Effects of X on Y Through Z

Parameter	T-Statistic	P-Value	Conclusion
X1 → Z → Y	9.382	0.000	Significant
X2 → Z → Y	4.182	0.000	Significant
X3 → Z → Y	1.058	0.290	Not Significant
X4 → Z → Y	1.549	0.121	Not Significant

The findings indicate that Community Participation (X3) and Rural Tourism Products (X4) do not have significant indirect effects on Well-being (Y) via Sustainable Agrotourism (Z). However, Infrastructure (X1) and Local Benefit (X2) show significant indirect effects, suggesting their critical role in promoting community well-being through agrotourism.

Overall Effects of Tourism Development on Well-being (Y) and Sustainable Agrotourism (Z)

The overall effects of tourism development variables (X1, X2, X3, X4) on both Well-being (Y) and Sustainable Agrotourism (Z) are substantial, with significant findings summarized as follows:

Journal of Ecohumanism
2024
Volume: 3, No: 7, pp. 1309 – 1324
ISSN: 2752-6798 (Print) | ISSN 2752-6801 (Online)
https://ecohumanism.co.uk/joe/ecohumanism
DOI: https://doi.org/10.62754/joe.v3i7.4291

- Infrastructure (X1) and Local Benefit (X2) significantly impact both Sustainable Agrotourism (Z) and Well-being (Y) directly and indirectly.

- Community Participation (X3) and Rural Tourism Products (X4) lack significant direct or indirect influence, suggesting areas for improvement in these dimensions.

Discussion

Infrastructure (X1), Local Benefit (X2), Community Participation (X3), and Rural Tourism Products (X4), as well as their impact on Sustainable Agrotourism (Z) and Community Well-being (Y).

The Role of Infrastructure in Sustainable Agrotourism and Well-being

The analysis revealed that Infrastructure (X1) plays a crucial role in enhancing both Sustainable Agrotourism (Z) and Community Well-being (Y). This is consistent with the findings of Azizah (2014), who emphasized the importance of improving infrastructure in rural tourism to support economic growth and enhance quality of life. Adequate infrastructure, such as roads, electricity, and communication networks, facilitates access to rural tourism destinations, making them more attractive to visitors and increasing the flow of tourism revenue to local communities.

Furthermore, Infrastructure (X1) was found to have both direct and indirect effects on Well-being (Y) through Sustainable Agrotourism (Z). This aligns with the findings of Wiratini (2020), which showed that infrastructure improvements significantly boosted tourism development and, in turn, the local economy. The indirect effect underscores the idea that infrastructure not only supports tourism directly but also enhances sustainable practices in agrotourism, which further contributes to community well-being.

Policy Implication: To maximize the positive effects of tourism development on community well-being, policymakers should prioritize infrastructure development in rural tourism areas. This could involve improving transport links, public utilities, and communication systems to ensure sustainable agrotourism can thrive.

Local Economic Benefit as a Catalyst for Well-being

The findings demonstrate that Local Benefit (X2) has a significant positive impact on both Sustainable Agrotourism (Z) and Community Well-being (Y). This confirms the importance of ensuring that tourism development leads to tangible economic benefits for local communities, as highlighted in Pitana (2009). When local communities are actively involved in and benefit from tourism, they are more likely to support sustainable practices and engage in tourism activities.

This research extends the work of Amaliawati (2017), which found that local economic activities, particularly those related to agriculture and tourism, can lead to significant improvements in community well-being. The results also align with the findings of Spillane (2004), which emphasized that local benefit plays a crucial role in translating tourism growth into community-wide economic gains.

The indirect effect of Local Benefit (X2) on Well-being (Y) through Sustainable Agrotourism (Z) further highlights the need for integrated approaches to tourism development. By fostering agrotourism that includes local economic activities, such as selling local produce or crafts, communities can build more sustainable income streams that contribute to their overall well-being.

Policy Implication: Tourism strategies should focus on integrating local economic benefits into tourism planning. This could involve creating more opportunities for local businesses to participate in tourism-related activities, offering training in sustainable tourism practices, and ensuring that tourism income directly supports community development.

Journal of Ecohumanism
2024
Volume: 3, No: 7, pp. 1309 – 1324
ISSN: 2752-6798 (Print) | ISSN 2752-6801 (Online)
https://ecohumanism.co.uk/joe/ecohumanism
DOI: https://doi.org/10.62754/joe.v3i7.4291

Challenges in Community Participation

Despite the theoretical importance of community participation in tourism development, the study found that Community Participation (X3) did not have a significant impact on either Sustainable Agrotourism (Z) or Community Well-being (Y). This contrasts with much of the literature, which emphasizes the role of community involvement in ensuring sustainable tourism practices (Pitana, 2009; Azizah, 2014). The lack of significance may be attributed to the ineffective implementation of participatory mechanisms or insufficient motivation among community members to engage in tourism activities.

There are several potential reasons for the weak impact of Community Participation (X3). First, community members may lack the necessary resources, training, or support to actively participate in tourism development. Second, there may be a lack of trust or awareness regarding the benefits of tourism, leading to limited engagement. This is consistent with findings from Spillane (2004), which suggested that without proper support and incentives, community participation in tourism can remain low.

Policy Implication: To address these challenges, efforts should be made to strengthen community engagement by providing education on the benefits of tourism and offering support for community-led tourism initiatives. This could involve creating partnerships between local governments, NGOs, and tourism businesses to ensure that communities are empowered to play an active role in tourism development.

Limited Contribution of Rural Tourism Products

The study also found that Rural Tourism Products (X4) did not significantly impact Sustainable Agrotourism (Z) or Community Well-being (Y). This result suggests that the existing tourism products in rural areas may not be sufficiently developed or marketed to attract significant interest from tourists. Azizah (2014) noted that rural tourism products often lack the innovation or unique appeal needed to compete in the broader tourism market.

This finding aligns with the work of Nurhajati (2019), which emphasized the need for more innovative and differentiated tourism products to make rural tourism more competitive and sustainable. The lack of significant impact from Rural Tourism Products (X4) may also be due to the fact that many rural areas have not yet fully developed their tourism offerings, meaning they cannot yet contribute meaningfully to sustainable agrotourism or community well-being.

Policy Implication: To enhance the contribution of rural tourism products, tourism development strategies should focus on creating innovative, marketable products that reflect the unique cultural and natural assets of rural areas. This could include developing local food tours, traditional handicraft workshops, or eco-friendly tourism activities that appeal to the growing demand for sustainable travel experiences.

The Moderating Role of Sustainable Agrotourism

Sustainable Agrotourism (Z) was found to be a significant moderating factor in the relationship between tourism development and community well-being. This underscores the importance of promoting agrotourism as a sustainable practice that integrates both tourism and agriculture to benefit local communities.

The findings build on the work of Wiratini (2020), who found that sustainable agrotourism can act as a bridge between rural development and tourism growth. By promoting environmentally sustainable practices and fostering local economic participation, agrotourism can enhance the long-term benefits of tourism for local communities.

Policy Implication: To strengthen the role of sustainable agrotourism, governments and tourism developers should promote practices that support environmental conservation, local food production, and cultural

Journal of Ecohumanism
2024
Volume: 3, No: 7, pp. 1309 – 1324
ISSN: 2752-6798 (Print) | ISSN 2752-6801 (Online)
https://ecohumanism.co.uk/joe/ecohumanism
DOI: https://doi.org/10.62754/joe.v3i7.4291

preservation. This can include creating incentives for farmers to engage in agrotourism and providing training on sustainable agricultural practices.

Integration of Findings with Broader Research

The results of this study contribute to the broader body of research on rural tourism and sustainable development. While some aspects, such as the significance of infrastructure and local benefit, are well-supported by existing literature, the lack of significance in community participation and rural tourism products presents opportunities for further exploration. Future research could examine how to more effectively engage communities and develop tourism products that align with sustainable agrotourism models.

Overall, the study provides important insights into how rural tourism development can be structured to promote both sustainable agrotourism and community well-being. By focusing on infrastructure, economic benefits, and sustainable practices, tourism developers can create a more resilient and inclusive tourism sector that supports rural communities.

Limitations of the Study

This study, while offering valuable insights into the development of sustainable agrotourism and its impact on community welfare, has several limitations. First, the sample size of 203 respondents, though statistically valid, may not fully capture the diversity of perspectives across all villages in North Tapanuli. A larger and more geographically diverse sample could provide a more comprehensive understanding of the region's dynamics. Second, the study's reliance on cross-sectional data limits its ability to capture long-term changes and trends in tourism development and community welfare over time. Future research could benefit from a longitudinal approach to better assess the evolving effects of agrotourism. Additionally, the non-significant results for local community participation and rural tourism products suggest potential measurement or contextual issues that were not fully explored. More detailed qualitative studies focusing on these variables could uncover deeper insights into the barriers and facilitators of community engagement. Lastly, the focus on a single region may limit the generalizability of the findings to other contexts, and comparative studies across different regions would help validate the model in diverse environments.

Conclusion and Recommendations

This study highlights the significant influence of rural tourism development on community well-being, with a particular focus on sustainable agrotourism. Infrastructure development and local economic benefits were found to be the most critical factors in enhancing both agrotourism and community well-being. Improved infrastructure supports tourism access and agricultural productivity, while the direct economic benefits of tourism stimulate local engagement and uplift living standards. However, the findings reveal that community participation and tourism products alone do not yield significant results unless paired with proper support, training, and resource allocation.

Sustainable agrotourism was identified as a key moderating factor that enhances the relationship between rural tourism and community well-being. It bridges agriculture and tourism, providing economic, environmental, and social benefits to the local population. The findings underscore the need for integrated development strategies that combine infrastructure, local economic participation, and sustainability practices to maximize the positive impact of rural tourism on the community.

To capitalize on the benefits of rural tourism, local governments should prioritize infrastructure development, ensuring that tourism sites are accessible and that agricultural activities are supported by robust public services. Furthermore, tourism strategies should be designed to maximize local economic benefits by encouraging community ownership of businesses and creating opportunities for farmers to participate in tourism, particularly through promoting local products and agricultural experiences.

Journal of Ecohumanism
2024
Volume: 3, No: 7, pp. 1309 – 1324
ISSN: 2752-6798 (Print) | ISSN 2752-6801 (Online)
https://ecohumanism.co.uk/joe/ecohumanism
DOI: https://doi.org/10.62754/joe.v3i7.4291

Enhancing community participation through targeted training and resource provision will be essential for empowering locals to take an active role in tourism development. Additionally, efforts should focus on promoting sustainable agrotourism practices by supporting environmentally friendly farming and tourism activities that preserve local ecosystems. Cross-sector collaboration among tourism operators, agricultural stakeholders, and local authorities will be crucial to ensuring long-term sustainability and maximizing the well-being of rural communities.

References

Abdillah, P., Saraswati, E., & Purwanti, L. (2020). Effect of corporate social responsibility disclosure (CSRD) on financial performance and role of media as moderation variables. International Journal of Multicultural and Multireligious Understanding, 7(4), 457–475. https://doi.org/10.18415/ijmmu.v7i4.171

Akhyar Samosir, A. H., Lubis, S. N., & Lubis, A. A. R. D. (2024). Policy strategies for spatial planning in regional development of Kisaran City, Asahan Regency, Indonesia. Asian Multidisciplinary Research Journal of Economy and Learning, 1(1), 27-34.

Alda, R., Nasution, Z., Lubis, S. N., & Lubis, A. A. R. D. (2024). The influence of education, social, and healthcare expenditures on the human development index (HDI) in Bireuen Regency. Asian Multidisciplinary Research Journal of Economy and Learning, 1(2).

Anisah Sari. (2024). Sustainable community empowerment approaches in the mangrove ecotourism sector through creative initiatives in Sei Nagalawan Village, Serdang Bedagai Regency, Indonesia. Asian Multidisciplinary Research Journal of Economy and Learning, 1(2), 01-11. https://doi.org/10.70471/f8wchm54

Cohen, J. (2014, February 21). School climate policy and practice trends: A paradox. Teachers College Record.

Creswell, J. W. (2014). Research Design: Qualitative, Quantitative and Mixed Methods Approaches (4th ed.). Thousand Oaks, CA: Sage.

Dermawan Wibisono, 2003, Riset Bisnis, Jakarta: PT. Gramedia Pustaka Utama.

Diener, E., Suh, E. M., Lucas, R. E., & Smith, H. L. (1999). Subjective well-being: Three decades of progress. Psychological Bulletin, 125(2), 276–302. https://doi.org/10.1037/0033-2909.125.2.276

Gulo, T., Lubis, S. N., & Lubis, A. A. R. D. (2024). Income analysis of coffee farmers and its impact on regional development (Case study: Pematang Sidamanik District, Simalungun Regency, Indonesia). Asian Multidisciplinary Research Journal of Economy and Learning, 1(1), 20-26.

Hollweck, T. (2016). Robert K. Yin. (2014). Case study research design and methods (5th ed.). Thousand Oaks, CA: Sage. 282 pages. The Canadian Journal of Program Evaluation, 30(1), 108-110. https://doi.org/10.3138/cjpe.30.1.108

Jeffrey, D. S. (2015). The age of sustainable development. New York, NY: Columbia University Press.

Joseph, E. S. (2011). Rethinking macroeconomics: What failed, and how to repair it. Journal of the European Economic Association, 9(4), 591–645. https://doi.org/10.1111/j.1542-4774.2011.01030.x

Li, Y., Ismail, M. A., & Aminuddin, A. (2024). How has rural tourism influenced the sustainable development of traditional villages? A systematic literature review. Heliyon, 10(4), e25627. https://doi.org/10.1016/j.heliyon.2024.e25627

Lubis, S. N., & Lubis, A. A. R. D. (2024). Enhancing Indonesian coffee trade: Strategies for navigating and reducing trade barriers. International Journal of Innovative Research and Scientific Studies, 7(3), 1248–1267. https://doi.org/10.53894/ijirss.v7i3.3231

Lubis, S. N., & Darajat Lubis, A. A. R. (2024). The role of sustainable tourism in supporting community welfare has been echoed globally, aligning with the Sustainable Development Goals (SDGs) target to eradicate extreme poverty by 2030.

Marpaung, H., & Darajat Lubis, A. A. R. (2024). Assessing the impact of sustainable independent oil palm cultivation on rural development: A case study of Angkola Sangkunur Sub-District, South Tapanuli Regency. Asian Multidisciplinary Research Journal of Economy and Learning, 1(2), 12-19. https://doi.org/10.70471/wrr95s87

Masrizal, Lubis, S. N., & Darajat Lubis, A. A. R. (2024). Evaluation of the self-help housing assistance program (BRS) in enhancing rural area planning in Subulussalam Utara Village, Simpang Kiri District, Subulussalam City, Aceh Province. Asian Multidisciplinary Research Journal of Economy and Learning, 1(1), 14-19.

Sembiring, E. S. G., Irni, J., Sitinjak, R. R., & Pratomo, B. (2021). Growth response of Mucuna cuttings to concentration and duration of soaking shallot extract. Agrinula: Jurnal Agroteknologi Dan Perkebunan, 4(2), 122-129. https://doi.org/10.36490/agri.v4i2.162

Sen, A. (1999). Development as freedom. Oxford: Oxford University Press.

Sudarmini, N. M., et al. (2020). Strategi marketing mix melalui community-based pada agro-tourism di Gianyar Bali. Jurnal Bisnis dan Kewirausahaan, 16(2), 109-116. https://doi.org/10.31940/jbk.v16i2.1994

Sugiyono, (2017). Metode Penelitian Kuantitatif, Kualitatif, dan R&D. Bandung: CV. Alfabeta.

UNWTO. (2012). UNWTO tourism highlights, 2012 edition. UNWTO, Madrid. https://doi.org/10.18111/9789284414666

Vaqqi Riehanda Agung, Lubis, S. N., & Darajat Lubis, A. A. R. (2024). Evaluation of the self-help housing assistance program (BRS) in enhancing rural area planning in Subulussalam Utara Village, Simpang Kiri District, Subulussalam City, Aceh Province. Asian Multidisciplinary Research Journal of Economy and Learning, 1(1), 14-19.

Zaneva, M., Guzman-Holst, C., Reeves, A., & Bowes, L. (2022). The impact of monetary poverty alleviation programs on children's and adolescents' mental health: A systematic review and meta-analysis across low-, middle-, and high-income countries. Journal of Adolescent Health, 71(2), 147-156. https://doi.org/10.1016/j.jadohealth.2022.02.011

Journal of Ecohumanism
2024
Volume: 3, No: 7, pp. 1309 – 1324
ISSN: 2752-6798 (Print) | ISSN 2752-6801 (Online)
https://ecohumanism.co.uk/joe/ecohumanism
DOI: https://doi.org/10.62754/joe.v3i7.4291

Zulkifli Nasution, E., Suharizki, A., & Purwoko, A. (2024). Evaluation of housing development growth in Asahan Regency. Asian Multidisciplinary Research Journal of Economy and Learning, 1(1), 07-13. https://argaelpublisher.com/index.php/amjel/article/view/2.